WISCONSIN COUNCIL ON INVASIVE SPECIES

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For immediate release

May 3, 2005

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Opening up a can of (exotic) worms

Non-native earthworms changing northern hardwood forests

Gardeners covet earthworms for their composting abilities. Anglers dangle them on hooks. Kids giggle as they wiggle around in their hands. Home composters value them for their ability to reduce kitchen scraps. But many people don't realize that in the northern, glaciated regions of North America, the common earthworms we know and love are really exotic European invaders.

Earthworms hitchhiked over the ocean a few centuries ago with European immigrants and quickly made themselves at home. Their fast composting abilities speed up the nutrient cycling of organic material by eating the forest floor and mixing it with the mineral soil below. In worm-free conditions, fungi and bacteria decompose the forest floor slowly. Once exotic earthworms establish large populations, the forest floor is replaced with a dense layer of black soil—the kind you might want in your garden—but the change is hard on native forest plant communities.

Dr. Cindy Hale, a scientist with the University of Minnesota-Duluth Natural Resources Research Institute, collaborates with researchers across the region to study the impact of exotic earthworms across the western Great Lakes region in different types of forests. "We established sample points way out in front of the invasion in the worm-free areas, and also behind the leading edge where we see heavily worm-impacted areas," Hale explained. "Since starting this project in 1998, we've monitored the advance of earthworm populations and associated changes in the forest floor, soil structure and plant populations…so we can see the direct effects of the worms as they move into the forest. The changes these worms make can be dramatic, despite their low key appearance in the forest," Hale stated. "We've seen other data that suggests that worm invasions can lead to declines in soil invertebrates, changing populations of small forest mammals and amphibians, and may even facilitate exotic plant invasions."

As an invasive organism, earthworms are a concern of Governor Jim Doyle. "We are lucky to have beautiful forests in Wisconsin," Governor

Doyle said. "They are essential to the quality of life we've come to expect here in our great state. We now know that the earthworms used for fishing, gardening and home composting can negatively impact the health of our forests. We need to work together to come up with solutions and ensure that we have healthy forests well into the future."

University of Minnesota doctoral candidate Andy Holdsworth is documenting the mosaic of worm-free and worm-impacted areas across the Chippewa (Minnesota) and Chequamegon (Wisconsin) National Forests. He's finding that the more human recreational activities are taking place, the more exotic species of worms there are. It's clear that people are spreading exotic worms when they go fishing. Peter Murray, Chair of the Wisconsin Council on Invasive Species and Executive Director of Wisconsin Association of Lakes, states that "This is an unexpected and important issue that we have to face. Happily, anglers can halt further introductions without compromising their fishing opportunities." This can be done by simply dumping unused fishing worms (or <u>any</u> type of live fishing bait) in the trash (not in the water or on land!).

Earthworms spread slowly (approximately 5-10 meters/year) so people can do a lot to help prevent new introductions by being aware that anything that transports leaf litter, soil or compost can transport earthworms or their cocoons. Similar to the proper disposal of fishing bait worms in the garbage, the recommended action is easy for those individuals who operate kitchen vermicomposting systems: freeze all compost for about 1 month to kill all worms and their egg cocoons before introducing to an outside environment. Even in areas that already contain earthworms, vigilance is recommended to prevent the introduction of new, potentially destructive earthworm species.

There are up to 14 non-native worm species in the northern half of North America, eight of which have been documented in the field study. During the last glaciation, ice sheets covered Canada, Minnesota, Wisconsin, Michigan, North and South Dakota and parts of Iowa. In all of those areas the native earthworms were wiped out. South of that ice sheet there are native North American earthworms, but they're very different from the worms we Northerners bait our hooks with. It's just been in the last two to four decades that the European earthworms have begun to find their way into remote areas that were previously worm-free.

Information for this news release provided by the University of Minnesota-Duluth Natural Resources Research Institute.

This news release is sponsored by the Wisconsin Council on Invasive Species. The Wisconsin State Legislature created the Council, to which Governor Doyle appointed 13 members. The Council's mission is to prevent and reduce the harmful impacts of invasive species on Wisconsin's environment and economy, as well as human well-being. Funding for this news release was provided by the Wisconsin Coastal Management Program and the Natural Resource Foundation's C.D. Besadny Conservation Grant Program.